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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,458	01/23/2004	Jochen Asbeck	HN 1009 PUS	6756
7550 12/19/2008				
Robert P. Renke Suite 250 28333 Telegraph Road Southfield, MI 48034			EXAMINER AFZALL SARANG	
			ART UNIT 3726	PAPER NUMBER
			MAIL DATE 12/19/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/763,458

**Applicant(s)**

ASBECK ET AL.

**Examiner**

SARANG AFZALI

**Art Unit**

3726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Amendment filed 10/14/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 and 25-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. The applicant's amendment filed 10/14/2008 has been fully considered and made of record.

***Election/Restrictions***

2. Applicant in response to the restriction and election of species requirements filed on 11/16/2007 has elected claims 12-24. However, the listing of claims as amended on 10/14/2008 designate non-elected claims 1-11 and 26-36 as "Withdrawn" while method claim 25 is designated as "Original." The Examiner, based on the Applicant's election filed 11/16/2007 has not examined claim 25 and as such this claim is withdrawn as being directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Note that the Examiner has examined elected claim 18 which recites the limitation "indentations are formed sequentially" and has not examined non-elected claim 25 which recites the limitation "indentations are formed simultaneously."

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 25 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12, 13 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. (US 2005/0217109) in view of Yamaguchi (US 4,098,106).

As applied to claim 12, Spiegel et al. teach a method of making a camshaft assembly comprising:

providing a tubular shaft (1, Figs. 1a-b & 2)

sliding a plurality of cams (3, Figs. 1a-b), each having a through-aperture, onto the tubular shaft (1);

securing the cams onto the tubular shaft at defined distances from each other (Figs. 1a-b);

heating the tubular shaft between at least two cams (paragraph [0019], line 31);  
and

forming (in presence of heat) a lateral indentation (2, Fig. 1a-b & 2) in the shaft in the locally heated region.

Spiegel et al. teach that the pressing (forming of indentations 2) may occur while the tubular shaft is heated but do not explicitly teach that the heating step includes

locally heating the tubular shaft in at least one locally limited region between two cams and that during the locally heating the longitudinal portions of the shaft carrying the cams are maintained at a temperature which prohibits changes in structure or stress in the shaft at said longitudinal portions.

However, Yamaguchi teaches a method wherein a pipe subjected to a **hot forming process** (hot bending, col. 1, lines 32) is locally heated to achieve a plastic deformation inducing temperature in said heated area of said pipe resulting in a desired deformation (col. 1, lines 42-48).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to have provided the limited region between two cams on the tubular shaft of Spiegel et al. with a locally heating and hot forming, as taught by Yamaguchi, in order to induce a localized plastic deformation temperature on the tubular shaft at the desired location between the two cams which would facilitate an effective forming of the indentations without affecting the other regions of the shaft.

Note that Spiegel et al. teach heating and hot forming steps to facilitate the forming of the indentations in the shaft and Yamaguchi teaches that only a localized and limited area of the shaft/pipe which is subjected to hot forming is heated and as such, the rest of the shaft including the longitudinal portions of the shaft carrying the cams would have not receive any temperature changes. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have protected the cam carrying portions of Spiegel et al. shaft from any unnecessary temperature

gradients that would have had an adverse effect on the structural integrity of the shaft in order to provide a strong and effective cam/shaft connection.

As applied to claim 13, Spiegel et al./Yamaguchi teach the invention cited. Spiegel et al. further teach a method of making a camshaft assembly comprising forming projections surrounding the indentation to increase the outer diameter of the tubular shaft beyond the cross-section of the through-apertures of the cams (paragraph [0009], lines 1-15).

As applied to claim 16, Spiegel et al./Yamaguchi teach the invention cited. Spiegel et al. further teach a method wherein the step of hot-forming occurs with the tubular shaft clamped in a die (bottom die 11 and top pressing stamp 10, Figs. 3-5) such that in regions adjacent the indentation, the original outer diameter of the tubular shaft is substantially maintained (Fig. 2, paragraph [0019], lines 31-34 & paragraph [0020], lines 22-24).

As applied to claim 17, Spiegel et al./Yamaguchi teach the invention cited. Spiegel et al. further teach a method wherein the cams are slid onto the shaft after the step of hot-forming the indentations (paragraph [0019], lines 31-39).

As applied to claim 18, Spiegel et al./Yamaguchi teach the invention cited. Spiegel et al. further teach a method wherein the indentations (2) are formed

sequentially (paragraph [0020], lines 37) by introducing local mechanical force (by means of pressing stamp 10) at the locally heated region in the radial direction relative to a longitudinal axis of the tubular shaft (Fig. 2, paragraph [0019], lines 24-31).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. in view of Yamaguchi as applied to claim 12 above, and further in view of Makoto et al. (JP 61135434 A).

As applied to claims 14 and 15, Spiegel et al./Yamaguchi teach the invention cited including a conventional method of mounting cams onto the shaft but do not explicitly teach the radially cold-forming and hydraulic internal pressure to the tubular shaft to form press-fits with the cams.

However, it is well known in the art to use a pressurized fluid to provide an outward radial expansion of a tubular shaft into a press fit connection with the interior of an outer sleeve such as one taught by Makoto et al. wherein the inside of a hollow cam shaft (11, Fig. 4) is pressurized by pressure fluid to radially expand the material (12) of the shaft into a press-fit connection with the cams (13's & 14's, Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided Spiegel et al./Yamaguchi with a conventional cold forming mounting step utilizing hydraulic internal pressure technique in view of the teachings of Makoto et al. in order to effectively secure the cam components onto a cam shaft.

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al./Yamaguchi as applied to claim 18 above, and further in view of Good (US 3,210,223).

Spiegel et al./Yamaguchi teach the invention cited including the step of introducing local mechanical force at local region in the radial direction relative to the longitudinal axis of the shaft but fails to explicitly teach the claimed bending moment/alignment of the tubular shaft.

However, it is well known in the art to subject a workpiece to a pre-stress loading and deformation at desired locations in order to counteract any subsequent deformation that may arise in the workpiece once subjected to any additional processes or during use such as one taught by Good wherein a bending moment is provided in a shaft (33, Fig. 7) to oppose bending or warping force set up in the axle (shaft) during the heat treatment (col. 8, lines 15-20) resulting in the axle (shaft) staying in straight position.

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided the shaft of Spiegel et al./Yamaguchi with a bending moment in light of the teachings of Good in order to provide an effective means of counteracting



any undesired bends or deformity appearing in the shaft once subjected to the indentation forming step.

Note that both Spiegel et al. and Good are pertinent to one of the problems with which the instant invention is concerned with, which is mainly to provide an improved shaft assembly subjected to different manufacturing processes that may compromise the straightness and rigidity of the shafts.

Regarding the limitation "by cooling", note that since Good teaches the heating step, also teaches the cooling step that would naturally occur after each heating step.

8. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. in view of Yamaguchi as applied to claim 12 above, and further in view of Haerr (US 3,025,905).

As applied to claims 21-23, Spiegel et al./Yamaguchi teach the invention cited including heating region of the shaft and upper and lower forming dies to provide mechanical force on the shaft but do not explicitly teach the electric resistance heating step, opposed electrodes and introducing a force with at least one of the electrodes.

However, it is well known in the art to use two opposed electrodes substantially located transversely to the longitudinal axis of a workpiece to provide both the local heating and mechanical force in hot-forming a workpiece such as one taught by Haerr (Fig. 2) wherein resistance heating elements (13) are located in both the upper die (elements 13, 18, 7) and lower die (elements 13, 10, 11, 12, 6).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided the forming dies of the of Spiegel et al./Yamaguchi with opposing electrodes and resistance heating elements in light of the teachings of Haerr in order to provide an effective means of hot forming local regions of the shaft.

### ***Response to Arguments***

9. Applicant's arguments, see "Remarks", pages 1-3, filed 10/14/2008, with respect to the rejection(s) of claim(s) 12, 13 and 16-18 under 35 USC 102(e) anticipated by Spiegel et al. and claims 14-15 and 19-24 under 35 USC 103(a) over Spiegel et al. in view of Makoto et al., Good and Haerr have been fully considered and are persuasive. Therefore, the 102 (e) rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Spiegel et al. in view of Yamaguchi ((US 4,098,106).

Note that Spiegel et al. as modified by Yamaguchi teach the hot forming and locally heating steps as in newly amended claim 12, 13, 16-18 and Makoto et al., Good and Haerr are relied upon to teach only the deficiencies of Spiegel et al. and Yamaguchi in respect to dependent claims 14-15 and 19-24.

Applicants amendments to the title and claims and cancelling of claims 20 and 24 are accepted and as such the rejection of claims 18, 20 and 22 under 35 USC 112, second paragraph and objection to the specification are withdrawn.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARANG AFZALI whose telephone number is (571)272-8412. The examiner can normally be reached on 7:00-3:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sarang Afzali/  
Examiner, Art Unit 3726  
12/9/2008

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